

# Perioperative glucose management in patients undergoing cardiac surgery : effectiveness of the University of Ghent Insulin Protocol.

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## Background

- Several insulin infusion protocols have been developed to maintain glycaemia levels within normal limits during and after cardiac surgery with cardiopulmonary bypass (CPB).
- We developed an easy applicable protocol (University of Ghent Insulin Protocol or UGIP) for achieving a glucose level between 70 and 180 mg/dL during cardiac surgery.

## UGIP Protocol

- Start a continuous infusion of insulin after induction of anaesthesia at a calculated rate in units per hour:
  - non-diabetic patients: glycaemia divided by 75 = units per hour.
  - diabetic patients: glycaemia divided by 50 = units per hour.
- This maintenance dose is doubled when rewarming is started during CPB.
- The initial dose is reinstituted after protamine administration.

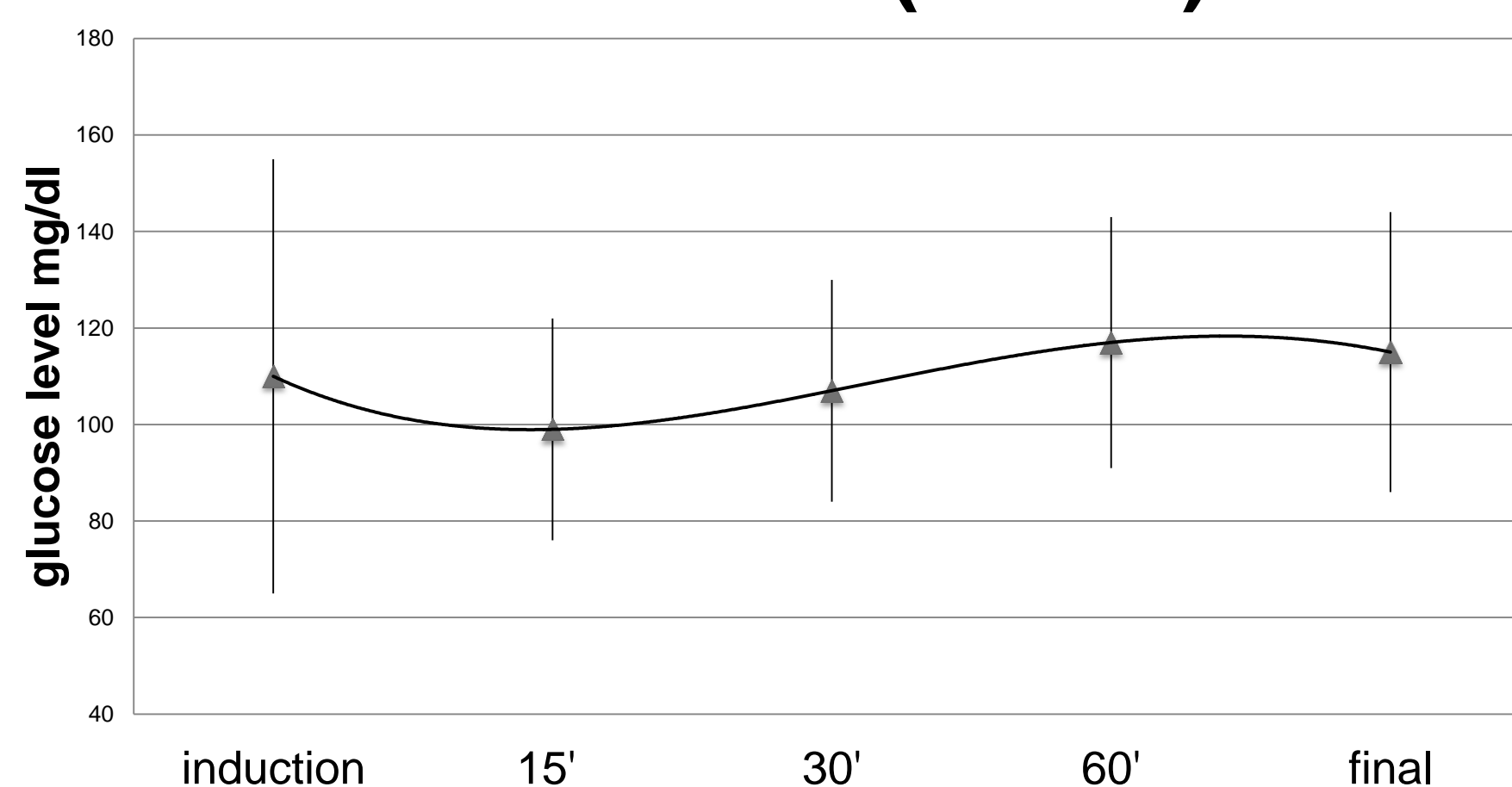
## Methods

- 776 cardiac surgery patients with and without pre-existing diabetes mellitus were treated with UGIP.
- Perioperative glycaemia levels were analysed using analysis of variance for repeated measurements.
- Effectiveness of treatment was assessed by comparing baseline glycaemia values to the values at the end of surgery. Backward stepwise regression analysis identified the independent variables associated with deviation of baseline glycaemia values.
- Data are expressed as mean  $\pm$  standard deviation.

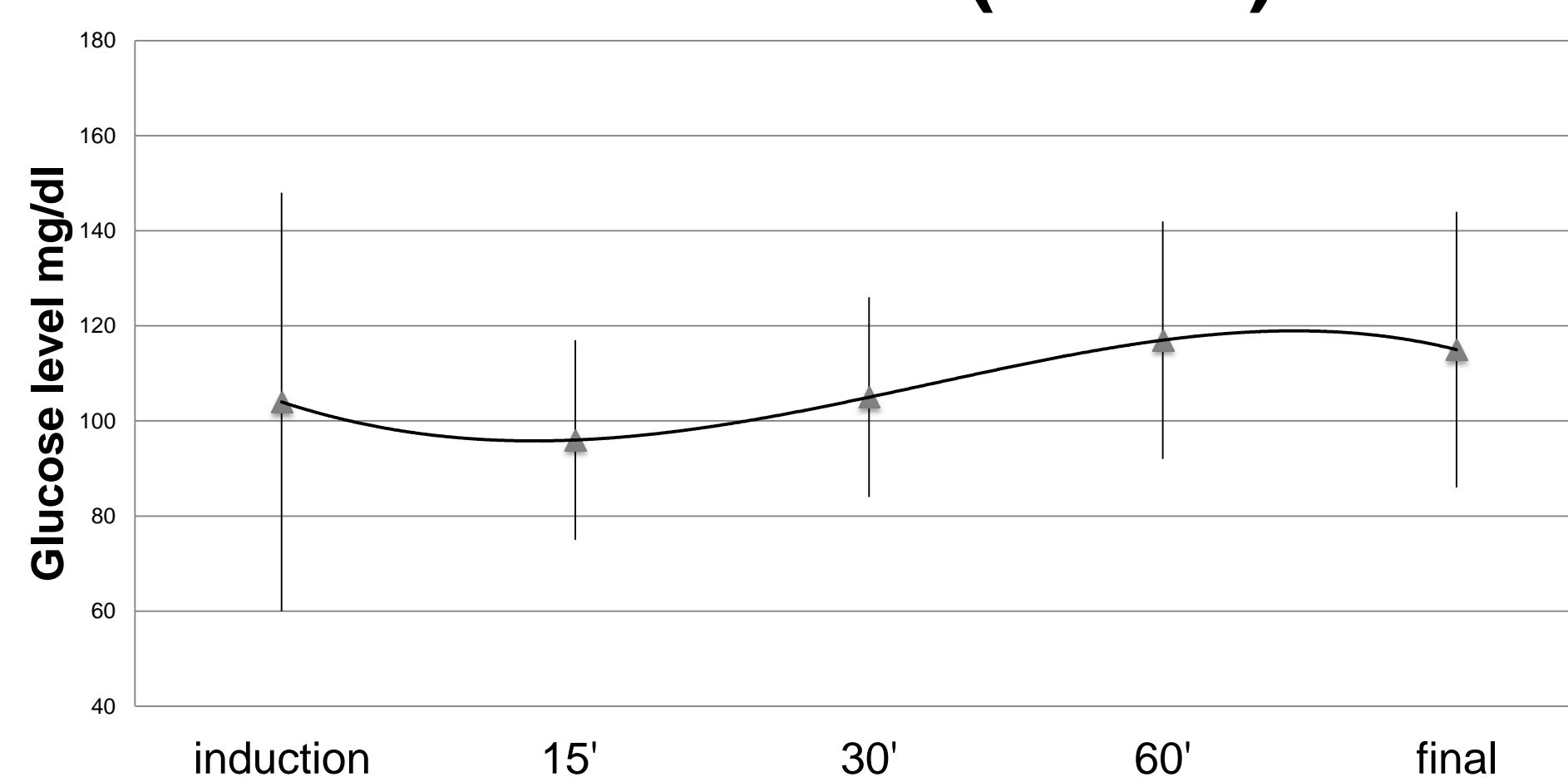
## Results

- Difference between glycaemia at baseline and at the end of the operation was  $6 \pm 50$  mg/dL ( $110 \pm 45$  vs  $116 \pm 30$ ,  $p = 0.001$ ).
- Age  $> 70$  years ( $p = 0.025$ ), use of corticosteroids ( $p = 0.002$ ) and the presence of diabetes mellitus ( $p < 0.001$ ) were identified as independent risk factors for changes in perioperative glycaemia.

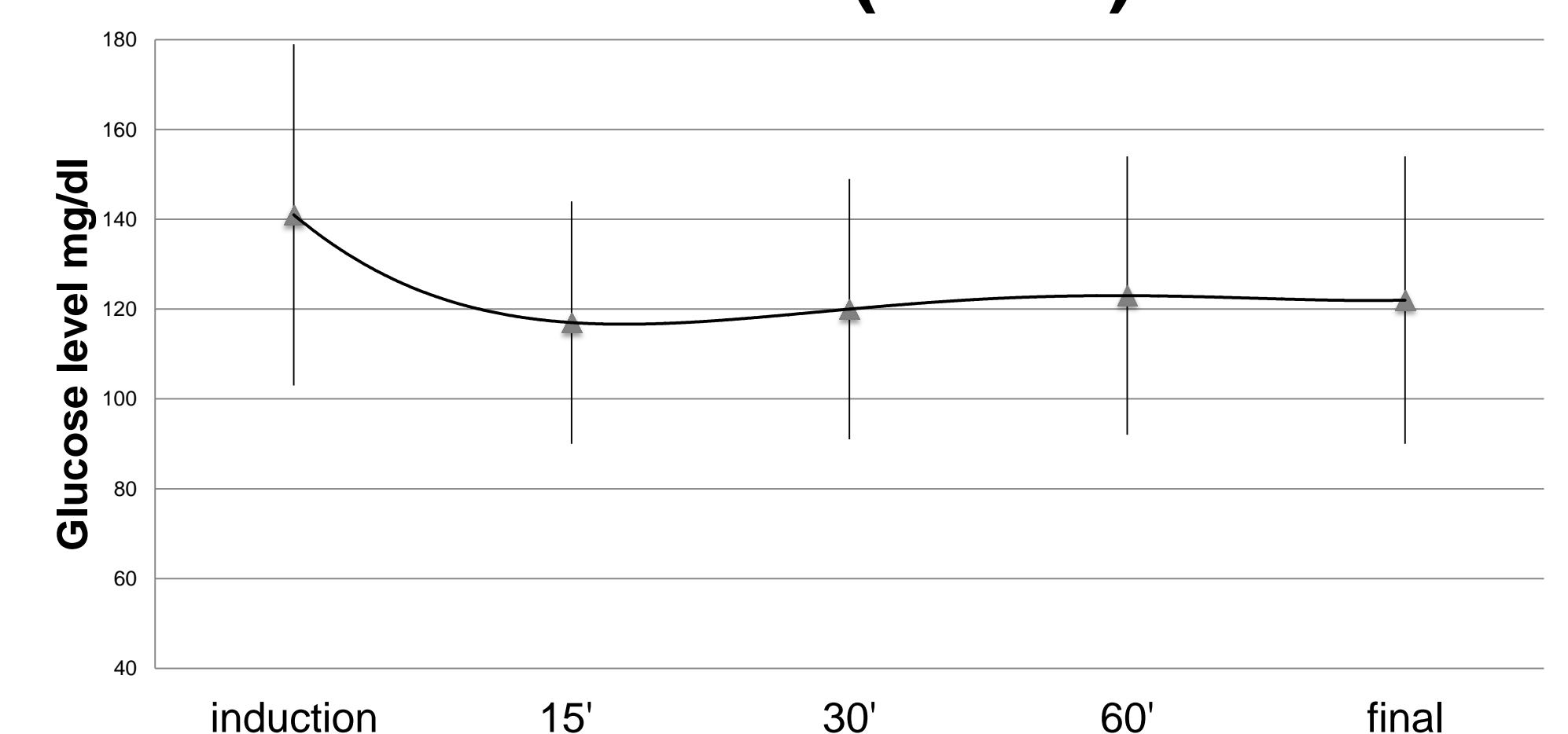
All Patients (n=776)



Non-Diabetics (n=665)



Diabetics (n=111)



## Conclusion

- UGIP preserved perioperative blood glucose levels within narrow limits.
- Risk factors for important deviation of pre-induction glycaemia were the presence of diabetes mellitus, the use of corticosteroids and age  $> 70$  years.